glosso-pharyngeus upon the taking place of the act of deglutition. When the superior laryngeal nerves are irritated electrically a swallowing movement is called out, and about one second after this, the elevation of the larynx ensues, and on the bared cervical part of the œsophagus a contraction takes place. If now, immediately after the elevation of the larynx, which indicates the first part of the act, the glosso-pharyngei are tetanized for a short period, the contraction of the œsophagus does not take place.

ISAAC OTT, M.D.

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b.—GENERAL PATHOLOGY OF THE NERVOUS SYSTEM.

ON PROCESSES OF DEGENERATION AND REGENERATION IN THE NORMAL PERIPHERAL NERVOUS SYSTEM. By Sigmund Mayer, *Prag. Vierteljahrsch.*, 1881.—The essential result of the author's investigations is, that in the peripheral nervous system of vertebrates there is a continual disappearance of medullated nerve fibres in variable number, while later a certain number recover their formerly normal condition. From this it appears that the medullated nerve fibres are not stable structures, but succumb one by one during the course of the various life processes which effect changes in their histological or chemical structure; so that the phenomena which the author is inclined to consider normal and subservient to the purposes of the organism indicate that they possess not so much of a perennial as a cyclical duration of life.

The author considers the full-grown rat (*mus. decumans*) as the best animal for examination, as this process of degeneration and regeneration seems to be quantitatively more decided in the rat than in other animals. The preparations were either examined fresh in a ½-per-cent. solution of sodium chloride, or treated with a solution of hyperosmic acid (1:1000) for some time before teazing. The processes of degeneration commence by a subdivision of the medullary substance, while at the same time it has a more decided glistening appearance, and stains blacker with hyperosmic acid. The nuclei of the sheath of Schwann are usually enlarged at this stage; the fat-like subdivisions of the medullary substance increase more and more, although in portions the process disappears, the fat-like derivations of the myelin being no longer present, the contents consisting of a fine granular mass

only. At the same time the fibres appear smaller, showing at this stage continual changes in their dimensions. Finally the contents of the nerve fibres are reduced to a minimum of fine granular matter and dark-shining nucleoli, which lie in a delicate fibrillary structure containing nuclei, so that it is easily possible to mistake them for non-medullary fibres or elements of the intervening tissues. The axis-cylinder disappears also, along with the degenerative modifications of the medullary sheath, and loses for the time being its existence as a definite structure. The degeneration processes in the majority of cases extend throughout the fibre, although occasionally in segments, with intervening normal portions. The stage of regeneration is recognized by the more or less completely developed constituents of a new normal nerve fibre, namely an axis-cylinder with an envelope of normal myelin. These newly formed constituents are enclosed by the remains of the old degenerated fibres, called by the author the degenerative envelope, the latter being enclosed by the sheath of Schwann which withstands the degeneration changes. The newly formed portions between the unchanged parts of the fibre possess a somewhat thinner medullary sheath, and is much narrower than the latter, from which it is separated by constrictions resembling those of Ranvier. Several newly developed fibres may form with one of the old sheaths of Schwann. As the regeneration envelope gradually disappears, the newly formed fibres finally acquire completely the appearance of the unchanged fibres, except that the sheaths of Schwann and Henle nearly always appear hypertrophied. These changes may be observed more or less distinctly in man, mammals, birds, fish, and amphibians; they are particularly well shown in the nictitating membrane of the frog. They are found in the cerebro-spinal and sympathetic nerve fibres, but more rarely in young animals than in old ones. Concerning the significance of these changes the author is somewhat reserved.—*Centralbl. f. Med. Wiss.*, No. 40, 1881.

PARALYSIS OF THE HANDS AND FEET FROM DISEASE OF NERVES.—Dr. Granger Stewart, in a paper read before the Medico-Chirurgical Society of Edinburgh March 2, 1881, describes three cases of a peculiar form of paralysis in the hands and feet, which he considers of peripheral origin.

The disease is characterized by an acute commencement, with more or less fever. The sensory functions are first implicated.

Numbness and tingling are frequent in the affected parts, associated with more or less anæsthesia, while pain is sometimes present. These sensory disorders affect the hands and feet simultaneously. Paresis affects the most distal parts first, extending up the limb from one group of muscles to another. Voluntary motion is rapidly diminished, so that at the end of a week the patient may be unable to flex or extend the fingers or toes. Power of coördination is not interfered with to a marked degree. In rare cases the functions of the bladder and rectum may be affected. The skin reflexes may be absent, but usually react to a strong stimulus. The patellar tendon reflex is usually lost at an early stage, but "ankle clonus" may be present, with the former absent. Trophic changes appear in the form of rapid muscular atrophy, congestion and glossiness of the skin, mal-nutrition of the nails, and slight œdema. The disease tends toward recovery, but has a proneness to recurrence. In one fatal case the median, ulnar, and tibial nerves were particularly affected, the axis-cylinders appeared swollen, and a number of rounded bodies resembling colloid bodies were observed; in some cases they had undergone fatty degeneration and transformation into compound granular corpuscles. Aside from evidences of fatty degeneration, some nerve fibres were completely destroyed and replaced by fibrous tissue. Secondary degeneration of the columns of Goll and of the direct cerebellar tracts were observed. Dr. Stewart is inclined to the view that the disease commenced in the sensory nerve-endings—as the sensory preceded the motor disturbances,—progressing as an ascending neural affection. The disease differs from Landry's acute ascending paralysis, in the absence of sensory symptoms in the latter. He suggests that the premonitory but trembling attacks of paralysis, involving certain nerves in locomotor-ataxia, may be explained by assuming them to be due to peripheral disease. Ergot during the acute stage, and strychnia, friction, and electricity in the later stages, were found useful.—*London Med. Record*, Oct. 15, 1881.

NOTE ON THE PATHOLOGICAL ANATOMY OF DIPHTHERITIC PARALYSIS. E. Gaucher, *J. de l'Anat. et de Phys.*, xviii, p. 17.—In a case of paralysis of the palatal muscles and paresis of the extremities, following diphtheria, in a child two years of age, which terminated in death after one month's duration, a careful examination of the nervous system gave an absolutely negative result.

A second case was that of a boy aged 11, affected with diphtheria, followed by paralysis of the throat muscles, later involving the extremities, and the muscles of the back, and resulting in death from asphyxia twenty days after the commencement of the paralysis. On microscopical examination, the brain was found hyperæmic only; in the anterior roots of the cord about one third of the fibres exhibited marked changes, consisting of complete absence of the medullary sheath, increase in number and size of the nuclei, while the axis-cylinders appeared perfectly normal. No changes were found in other parts of the nervous system. The manner in which the medullary sheath may have been lost is not described. No granular corpuscles were found; the neurilemma was normal.—*Centralbl. f. Med. Wiss.*, Oct. 22, 1881.

ALTERATIONS IN THE SPINAL CORD IN INFANTILE SPINAL PARALYSIS AND IN PROGRESSIVE MUSCULAR ATROPHY. Roger and Damaschino. *Rev. de Méd.*, etc., 1881-2.—Respecting the lesions found in infantile spinal paralysis in nearly the whole height of the lumbar enlargement, inflammatory softening existed in the anterior gray columns on the right side being more extensive than on the left, the focus of softening was nearly fluid, its periphery distinctly sclerosed. In the dorsal region no decided softening was found, but abnormal distension of the lymph-spaces, of the blood-vessels, with granule cells. The same condition was found in the cervical region, though developed to a much less degree. The foci of softening were formed by a reticulum of the finest fibrillæ, numerous nucleated granule cells, partly free and partly in the vascular walls. The ganglion cells on the right side were completely atrophied; on the left, the internal anterior group remained. The atrophic ganglion cells were generally reduced in size, shrunken, granular, with indistinct nucleus and nucleolus, and a number of their processes entirely destroyed. The nerve fibre of the gray substance failed also entirely. The whole antero-lateral columns were distinctly atrophied; there existed a certain degree of sclerosis and an appreciable multiplication of connective-tissue nuclei. The anterior roots were also atrophic. It is to be observed that the atrophy of the ganglion cells of the anterior horns were not confined to the spot of softening, but were also to be found, though to a less extent, in the remaining portions of the cord. The affected muscles presented the characteristics of simple atrophy; in part, marked interstitial

development of fat. The authors look upon infantile spinal paralysis as a central myelitis—a softening of inflammatory character, principally in the region of the gray anterior columns, with secondary atrophy of the nerves and roots.

A second communication relates to a typical case of progressive muscular atrophy, in which a simple atrophy of the ganglion cells of the anterior horns was found without inflammatory appearances. The atrophic degeneration of the ganglion cells is analogous to that of infantile spinal paralysis; it involves also the antero-lateral columns, the anterior roots, and the nerves.—*Centralbl. f. Med. Wiss.*, Nov. 5, 1881.

On the Electrical Excitability in Spinal Cord Disease of Dementia Paralytica, with a Contribution to the Pathological Anatomy and the Pathology of the same. F. Fischer, Jr. and Fr. Schultze. *Archiv. f. Psych.*, etc., xi, 3.

In three cases of dementia paralytica, with paresis of the lower extremities, associated with spastic symptoms and exalted tendon reflexes, careful electrical examinations were made by the authors. They found that as long as the anterior roots or anterior horns were not affected, only moderate changes—principally quantitative—occurred in the electrical excitability. The galvanic excitability was diminished, principally in both peroneal nerves, while the Faradic excitability was preserved. Certain nerves, the accessorii and ulnares, for example, possessed a somewhat exalted excitability on one side; or the galvanic excitability of the right side was exalted, while the left was diminished, as in the third case described below, in which also the Faradic excitability was diminished in the peroneus and in the accessorius at one time. Cathodal closing tetanus (Ca. C. Te.) was retarded, or the anodal opening contraction (An. O. C.) was absent.

In Case 1 Schultze found degeneration of the latero-pyramidal tracts in the dorsal region only, indicating, from the non-involvement of the cervical and lumbar portions not a secondary but an independent primary affection. In Case 2 the medulla and pyramids were intact; the upper portion of the cervical cord exhibited degeneration of the columns of Türck, the latero-pyramidal tracts, and linear degeneration of the posterior columns. Similar changes were found in the dorsal cord, except that the

anterior columns remained free. Abnormal formation of the gray matter (2–3 cm. expansion) was also found in the dorsal portion. So that in this case also a primary degeneration of certain conducting tracts of the cord was present. In Case 3 the white substance was intact, but the gray substance in the lower half of the dorsal region was of a peculiar formation—an approach of Clarke's columns to each other. Both anterior horns were much reduced in size.—Rev. in *Centralbl. f. Med. Wissensch.*, Dec. 10, 1881.

An Endemic of Paraplegia among Chinese Coolies.—Dr. H. N. Vineberg, of Waiohina, Sandwich Islands, reports in the *Canada Medical and Surgical Journal* for November, 1881, the appearance of a peculiar disease among the Chinese laborers on the several sugar plantations on the islands. Of about three hundred coolies employed on the plantations which Dr. Vineberg attends, fully seventy-five have been attacked. The disease often sets in suddenly, the Chinaman dropping down in the field, unable to stand. Sometimes the patient's walk is not unlike that of locomotor ataxia when the ataxic muscles are beginning to show signs of motor paralysis. The leg and the foot are raised high, brought forward slowly and apparently with an effort, and the whole length of the sole touches the floor at once in completing the step. He walks with his legs wide apart. The muscles feel firm to the touch, and on being tightly grasped by the hand the patient calls out with pain. Tactile sensibility is not impaired, the reflex power is nominal. Pain is first referred to the region of the knees and afterward vaguely to the thighs and legs, but most frequently to the calves only. No pain whatever is referred to the spine, and hard knocks with the knuckles over the spines of the vertebræ elicit no cry of pain. Power over the sphincters of the rectum and bladder is retained to almost the very last. The bowels are usually costive; the appetite is good and the tongue may be clean or slightly furred. The pulse is frequently from 90 to 100 per minute, and is rather small and compressible. The urine is clear, moderate in amount, and free from albumen. The case may terminate in one of three ways: death, recovery, or pass into a chronic state. In most of the cases ending in death, the paralysis rapidly extends upward, invading the whole muscular frame, the muscles quickly atrophy, and the patient dies asphyxiated, from paralysis of the respiratory ap-

paratus. About 30 per cent. came under this head; in the greatest number of cases it took place between the third and fourth week. Owing to the superstitions of the Chinese about the dead, the doctor has only been able to hold one *post-mortem*. In that case the lungs, liver, kidneys, spleen, stomach, and bowels, appeared normal. The mitral valves were thin and small, but showed no signs of inflammatory changes. Recovery takes place at a variable period, but most often in from three to four weeks, and is liable to be interrupted by several relapses, each of which lasts from three to four days. As regards the etiology of this disease the author thinks "Chinese habits," masturbation, etc., with overcrowding and want of proper ventilation, act as predisposing causes. He also states that the diet of coolies consists of rice, peanut oil, bad pork, and semi-putrid sausages. It is more than probable that the putrid meat is the chief cause, as it has been known to produce similar disturbances in Europeans. Moreover, on one plantation when beef rations were given fresh from the commissariat no case had occurred. But some time after, while one of the directors was on a visit to the plantation the Chinese laborers petitioned him to have their beef ration exchanged for its value in money, which was granted them. They began to indulge freely in their favorite dish, putrid sausages and peanut oil, and in less than three weeks from that date there were no less than thirty cases on the plantation. Again, as soon as the money system was put a stop to and vegetables added to the rations, no fresh cases occurred. Connected with the plantations are several small planters who plant corn on shares. They also employ chiefly Chinese coolies who, as a rule, have always some vegetables, which they grow themselves, while their rice and beef are served out to them by the planters themselves. None of the planters' coolies have been affected by the disease. The treatment employed consisted in a generous diet, with vegetables—particularly cabbage,—better ventilated and roomy quarters, and stimulants in cases with a feeble circulation. Stimulating liniments to be well rubbed into the paralyzed limbs, and where the paralysis showed no sign of extending, strychnia and electricity. It is no more than just to say that where this course of treatment was followed out, even if only in part, then the percentage of the cases of recovery was highest.—*Med. and Surg. Reporter*, Jan. 7, 1882.

CARDIAC SYMPTOMS OF CHOREA.—Dr. O. Sturges (*Brain*, July,

1881) summarizes the several factors of the heart symptoms thus: 1. In the course of the chorea of childhood the heart's action is apt to become irregular or uneven, and its first sound to be followed by apex-murmur, which is variable in pitch, influenced by posture, seldom audible in the axilla or at the angle of the scapula, and which disappears along with or shortly after the chorea, the heart and the circulation suffering no injury. 2. This liability on the part of the heart to what, from its signs, would seem to be a functional disturbance, is independent of the violence or method of the chorea, but dependent upon the age of the patient, the younger children being most, and the elder least, liable; while beyond childhood there is little, if any, liability of the kind. 3. These heart signs of chorea—acute rheumatism being excluded—give rise, as a general rule, to no symptoms whatever affecting the health or comfort of the child. They make no apparent difference to the prospects of recovery, or to the structural integrity of the heart. Nevertheless, choreic children having this murmur and happening to die either with, or shortly after recovery from, the chorea, very commonly exhibit a beading of recent lymph on the mitral valves. Such, he says, are the chief statements which statistics seem to warrant. To these he adds another, which, so far as he knows, has never been statistically recorded, but which no one will gainsay. It is, indeed, the most constant of all the heart symptoms of chorea, and met with at a later age than the rest. He refers to the acceleration of the heart and pulse.—*Amer. Jour. Med. Sci.*, Jan., 1882.

ALBUMINURIA AS A SYMPTOM OF EPILEPTIC ATTACKS.—Kleudgen, *Arch. f. Psych.*, etc., xi, p. 478. The author concludes from an examination of 57 cases: (1) That by a certain degree of concentration traces of albumen may be detected in all urine. (2) That without increase in the specific gravity the amount of albumen may increase without our being forced to conclude that renal disease is present. (3) That post-epileptic urine has nothing characteristic about it. (4) Rarely, the post-epileptic urine is richer in albumen than before, and then only to a slight degree, and often dependent on the presence of seminal fluid. The specific gravity may be high or low after the attack; the reaction may be of an alkaline nature, or acid. Sugar was not found.—*Centralbl. f. Med. Wiss.*, Oct. 22, 1881.

On Epidemic Cerebro-Spinal Meningitis, particularly Concerning the Residual Combined, Disturbances of Hearing and Equilibrium.—Moos, Heidelberg, 1881.

From four cases in which both disturbances of hearing and of equilibrium were present following epidemic cerebro-spinal meningitis; also from the facts of pathological anatomy and physiological experimentation concerning the functions of the semicircular canals, he concludes: (1) That the centre for the sense of equilibrium is in the cerebellum. (2) That the neural end-apparatus in the crista of the ampullæ, perhaps also in the saccule, is in connection with the above centre. (3) That diseases or excitation of the end-apparatus or its contiguous structures can produce the same symptoms as diseases or excitation of the central apparatus itself. This applies especially to vertigo. (4) Unilateral labyrinthine affections, whether the same be of primary origin or communicated from the cranial cavity, manifest themselves by vertigo. (5) Should the opposite side become affected in the same patient, the new affection begins also with vertigo, followed shortly by a staggering gait. (6) Sudden unilateral paralysis of the ampullary nerves fails to produce these symptoms; (7) and the same rule applies usually to lesions of the nervous apparatus of the vestibule of chronic origin. (8) Bilateral hemorrhages, or suppurative inflammation of acute origin in the ampullary neural end-apparatus, with permanent paralysis, particularly as a result of cerebro-spinal meningitis, produce a staggering gait for a long time. Children, and those affected at the same time with disturbances of vision, remain affected longer and more intensely. When, in time, the muscles and visual senses are sufficiently practised to act vicariously, the staggering gait disappears.

Epidemic Convulsions.—An interesting contribution to the literature of this subject appeared in *Brain*, for October, 1881. It is a paper prepared by Dr. David W. Yandell, in which he describes an epidemic which reached its height about 1800, to reappear for several years afterward, and before it declined had involved Kentucky, Tennessee, and a part of the Carolinas. At one time so general was its spread that not less than three thousand persons fell in convulsions to the ground. Under the preaching of the Rev. James McGready, who was loud in voice and passionately eloquent, a revival of religion and the onset of the epidemic began simultaneously in Logan County, Ky., about

1787. In 1800 the religious excitement ran so high that ordinary daily employments were abandoned by men, women, and children, and continuous camp-meetings kept the ardor of religious feeling at a full blaze. Immense concourses gathered in the woods, of persons "convicted of sin," who sang to and exhorted each other through the day and by torchlight by night. Such unusual proceedings produced a marvellous effect upon the imaginations of the simple-minded and emotional, heightening to an unheard of pitch the effect of perfervid oratory. These physical manifestations cannot be regarded as the most solid proof of "conversion," and hence every resource was drawn upon which would increase the mental and physical susceptibility. It is no wonder that thousands fell in convulsions, and that some ran mad for a season, "raving, howling, praying, day and night." A preacher named Grenade, a veritable son of thunder, was followed by great crowds, who sought to get religion by the startling effects his impassioned oratory and violent demonstrations invariably produced. So much power had he over this believing and excitable people that, according to his own words, they fell as if slain by a mighty weapon, and lay in such heaps that they were in danger of suffocation. A few shrieks from the women would precipitate the congregation in convulsions. In some persons there was numbness of the extremities, in others catalepsy, lasting occasionally for hours and even days. Sometimes they were seized by paroxysms closely resembling epilepsy, but most often a choreic form was experienced, called the "jerks." The jerks appeared first in the forearms, but later the entire body became terribly involved. The head was thrown about with alarming celerity, causing the hair, if it was long, "to crack and snap like the lash of a whip." Sometimes, says an observer, the subject was affected in a single member of the body, but at other times the spasms were universal. When the head alone was affected, it would be jerked from side to side so quickly that the features could not be distinguished. "When the whole system was affected," he continues, "I have seen the person stand in one place and jerk backward and forward in quick succession, the head nearly touching the floor behind and before. All classes, saints and sinners, the strong as well as the weak, were thus affected. I have seen some wicked persons thus affected, and all the time cursing the jerks while they were thrown to the earth with violence." From a very vivid picture of this frenzy given by Rev. R. McMemar, an eye-witness, quoted by Prof. Yandell, we learn that nothing in nature could

better represent this strange and unaccountable operation than for one to goad another alternately with a piece of red-hot iron. But the most incongruous and astonishing feature of the epidemic was the holy laugh, which was nearly akin to the ordinary attacks of hysterical laughter, and was regarded, like the convulsions, as a marked instance of the supernatural, and as a token of Divine favor. What could be more grotesque than to have a congregation in the most devout mood laugh aloud during a sermon, unless it was to see some of them gravely dance, and others end the performance by barking on all fours like so many dogs? In 1803 the infatuation had reached such a pitch that these ridiculous antics were esteemed by the credulous as exhibitions of heavenly interest in the unfortunate subjects. A great many attendants on worship were exempt by native absence of susceptibility, while others managed to control the impulses of an unstable nervous system which they could not help feeling. At last, in the name of order, the preachers turned their eloquence against these excesses, and the craze died away.—*Louisville Med. News*, Dec. 10, 1882.—W. R. BIRDSALL, M.D.

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c.—MENTAL PATHOLOGY.

CRIMINALITY IN ITS RELATIONS TO SCIENCE.—Lacassagne (*Du criminel devant la science contemporaine*, 1881) discusses this subject, and shows by statistics that crime has certain relations to times of the year. Thus, infanticide occurs most frequently in January, February, March, and April; homicide in July and August; rape most frequently in June. He divides criminals into, first, criminals from sentiment or instinct, under which are comprised the true incorrigible, habitual criminal, who commits crime in consequence of his psycho-physical constitution, and on whom neither punishment nor education can have any effect. Second, criminals by act or on occasion. The passions (anger, jealousy, cupidity, etc.) or the feeling of impunity lead this class to commit crime. The large majority of criminals belong to this class, and in it alone is punishment likely to be of avail. Third, criminals of thought, or, more properly, insane criminals, who, as Lacassagne remarks, should be treated in a criminal asylum and not with the other insane. There are two asylums of this kind in the United States of whose existence the majority of physicians